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CHEMONICS
INTERNATIONAL CONSULTING DIVISION

PROGRESS REPORT

JANUARY THROUGH JUNE 1981

SUBMITTED TO

THE MINISTRY OF RURAL AFFAIRS AND AGRICULTURE

BY

CHEMONICS INTERNATIONAL CONSULTING DIVISION

CONTRACT GOB/AID 511-111

SEPTEMBER 1981

CHEMONICS
INTERNATIONAL CONSULTING DIVISION

La Paz, September 1st, 1981

Eng. Jaime Sejas
Director General
Ministry of Rural Affairs and
Agriculture
La Paz

Dear Eng. Sejas:

It is a great pleasure for Chemonics to present to MACA our Progress Report corresponding to the period January through June 1981. This report outlines efforts made by four long-term advisers and two short-term advisers in five different technical areas in which Chemonics has responsibilities under Contract GOB/AID 511-111.

We again emphasize in the recommendations the need to assign Bolivian personnel to projects where foreign advisers exist. Only in this way can the efforts of our firm achieve long-run benefits for the country.

Sincerely yours,

Preston S. Pattie
Preston S. Pattie
Chief of Party

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SECTION I
INTRODUCTION

Activities of Chemonics during the period of this report (January through June 1961) included seed improvement, machinery maintenance, fruit processing and marketing, and organization and methods. Minimal support was given in the field of sector planning; work in data processing was practically eliminated. Long-term advisers who worked during this period were the following:

- * Dr. Adriel Garay, Seed Specialist
- * Mr. Leslie Rios, Heavy Equipment Maintenance Technician
- * Lic. Robert Sparks, Adviser in Organization and Methods
- * Dr. Preston Pattie, Chief of Party

Mr. Rios was away from post with leave without pay from February 5 to 25th because of sickness of a close relative.

A short-term adviser, Lic. Gustavo Vega, provided assistance in developing a feasibility study for a fruit storage and drying center in Tarija. This work lasted 5 weeks. Additionally, Mr. Andrew Dobson worked in Washington, D.C. as a short-term technician in the acquisition of equipment and tools for CODETAR's shop in the Chaco. Finally, the project Supervisor from Chemonics/Washington assisted in the preparation of modifications and an extension to our Contract during June.

During the period of this report, INCA and USAID carried out an evaluation of the Agricultural Sector II Project. To evaluate the part of the Project corresponding to the Gran Chaco, USAID utilized the efforts of its economist in La Paz, an agricultural economist from the University of Wisconsin, and an expert in soils from the Soil Conservation Service from the State of Montana. Evaluation of Chemonics' work was centered in the Office of Sector Planning of INCA. Lic. Walter Vargas, then Acting Director of OPS, made the results known in June, concurrent with the discussions to extend Chemonics' Contract.

Through the evaluations, various needs became apparent for additional technical assistance in the fields of soil conservation, sector planning, credit for small farmers, land clearing and others. The Director General of Agriculture, Eng. Jaime Sejas, decided that work in soil conservation should take first priority, and also a full-time adviser in sector planning was included in the Contract. However, it will not be possible to employ a person for the latter position because of current limitations of ISAIT in Bolivia. In addition, Eng. Sejas informed Chemonics of MACA's decision to terminate work in Organization and Methods when the Study of Human Resources is completed in July 1981. Chemonics agreed with MACA in this decision. Finally, the long-term position relating to data processing was eliminated, due to lack of financing for this area of work.

Next section of this report presents progress in the three field projects:

- * Seed Improvement
- * Heavy Equipment Maintenance
- * Processing and Marketing of Fruits and Vegetables

Then section III treats the two technical areas in which technical assistance is given at central level:

- * Sector Planning
- * Organization and Methods

Following is section IV which underlines progress on the supervision and support of the five mentioned projects, and in management of resources under Chemonics' responsibility.

In each sub-section, relevant background information is presented and objectives for the period of report are reiterated. Then, progress is presented, and finally suggestions and recommendations for each area of work are made.

Section V summarizes the recommendations, and Section VI presents conclusions and objectives for the period July through December 1981.

SECTION II
PROGRESS IN FIELD ACTIVITIES

A. Seed Improvement

1. Background and Objectives

At the beginning of this report period financing for the installation of the processing plant in Warnes had just been authorized by USAID. This authorization was based on the immediate need to dry, clean and select seed from more than 1,500 hectares planted in soybeans in Santa Cruz. This need was produced by farmers under supervision of MACA with the cooperation of CIAT and ANAPO.

The objectives for the report period had been: 1) installation of processing and drying equipment at the seed plant in Warnes, 2) development of soybean seed producers, 3) production of foundation seed in collaboration with CIAT, 4) preparation of norms for the certification of soybean seed. The goal for the development of seed producers and the installation of the processing plant was to begin with seed production in the summer of 1980-81. It should be recognized that these two crucial aspects must be overcome in order to make the seed program operational, and both depend on the quantity and quality of personnel that MACA dedicates to the program. Unfortunately, MACA's regional counterpart resigned and some months passed before he could be replaced. The new Regional Seed Director and counterpart of Chemonics in Santa Cruz is Eng. Eliodoro Vallejos.

2. Progress

a. Installation of Processing Equipment

Due to the importance of this aspect of the program and the limited time before the 1981 harvest, Chemonics provided support to the Seed Department of MACA in obtaining and interpreting plans and quotations for the installation of the Seed Plant in Warnes. It is worth mentioning that this activity does not fall within the consultant's obligations, however,

it is essential to the program and to our Adviser, in order that he can accomplish his work.

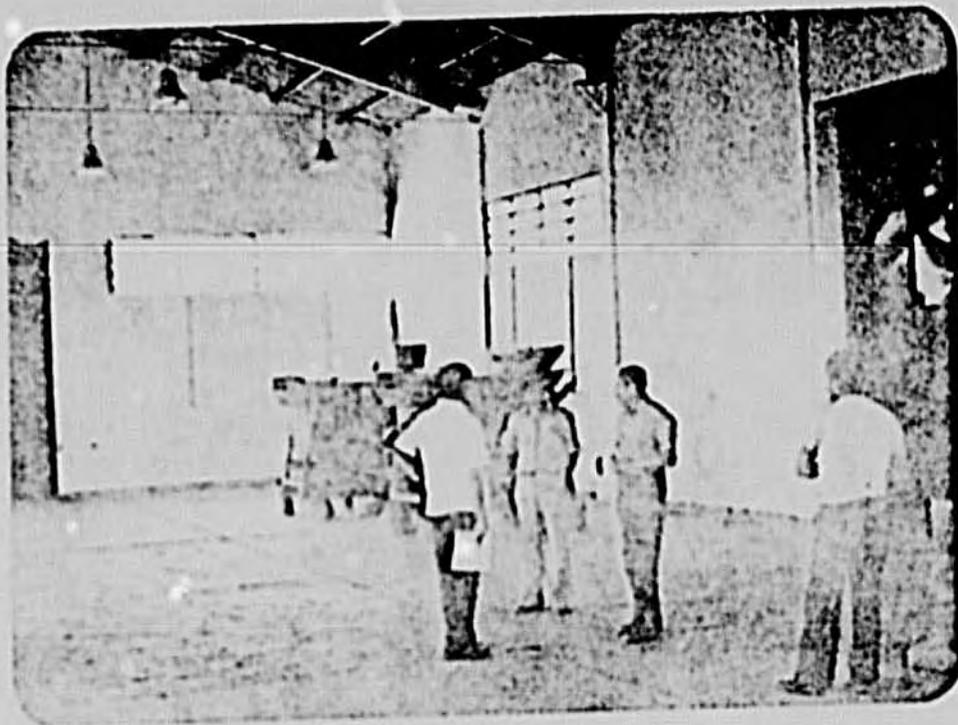
Early in February Chemonics' Adviser in Seeds, Dr. Adriel Garay, inspected the plant with Eng. Anibal Guzmán of MACA and Chemonics' Chief of Party to establish plans for three aspects of the work:

- * installation of machinery
- * installation/construction of drying silos
- * high voltage electrical installation

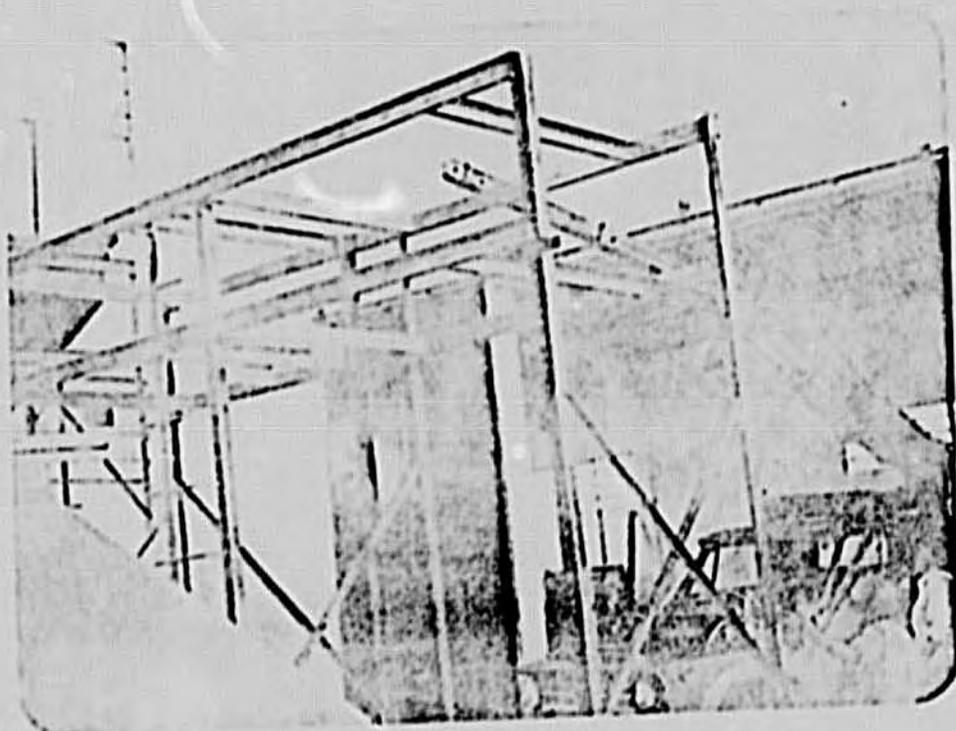
MACA proceeded in obtaining quotations for the electrical installation, which were presented to USAID through the Office of Coordination. Unfortunately, several errors were identified in quotations due to different interpretations of plans. Chemonics took the responsibility of returning the quotes to Santa Cruz to make corrections and obtain new quotations. In addition, it was discovered that the cost of installation of silos exceeded the available budget, thus presenting a serious problem due to the importance of having drying capacity in Santa Cruz, especially for soybeans. Germination tests made in Santa Cruz showed a 80 to 90% germination after three months storage when the seed initially enters the plant with 12% humidity. However, in cases when seed had 14% humidity initially, germination went down to 60% within three months.

Chemonics adviser recommended a functional short-run alternative at a lower cost: construction of drying bins inside the plant's reception room. A visit was made to the Saavedra Experimental Station where a similar installation exists, accompanied by a civil engineer who collaborated with the necessary designs. Later, USAID gave its approval for a small increase in the budget required for construction of the bins. Also additional plans were prepared, which had been missing from those needed for installation of seed cleaning machinery. New quotations for the three aspects of the work were obtained and presented.

Chemonics provided support in maintaining contact with the Engineering Departments of MACA and USAID, the Rural Development Division of USAID and the



Planning for the installation of machinery in
the Seed Plant. Warnes, February 1981.



Execution of the machinery installation.
Warnes, May 1981.

Coordination Office to clear up final details in the work to be carried out. We provided assistance in modifying a model contract prepared by USAID in order to coincide with the necessities of the work in Warnes. Final contracts were received in Santa Cruz on April 6, 1981, and some of the contractors had already begun work. A disagreement arose regarding the selection of one of the companies; this situation delayed work for several days. In addition, some minor errors in the methods of legalization of two of the contracts were observed by USAID, causing additional delays. Chemonics helped overcome these problems and the contracts were accepted by USAID in mid-April.

Unfortunately, the time required in obtaining plans and quotations and in termination of contracts did not permit putting the plant in operation by the optimum date, which would have been April 1st. Still other delays took place when it was necessary to modify some of the specifications in designs. Chemonics provided assistance to the Seed Department in various occasions in obtaining and channelling necessary documents and to confirm that the technical criteria are adequate. Finally, because of the length of time required by USAID to prepare checks, some of the contractors did not complete work in the minimum time possible. At the end of June installation was 90% completed.

b. Seed Certification and Development of Seed Producers

Field inspections, which were concentrated in soybean seed, were carried out among Eng. René Arancibia of MACA, Eng. Hebert Zurita of CIAT, Eng. Nelson Reyes of CIAT and Dr. Adriel Garay of Chemonics. The adviser and his counterpart prepared the forms required for field inspections in the flowering and pre-harvest phases. Use of these forms has served for on-the-job training of the technical team in aspects such as: methods of sampling of contaminants, recognition of varietal characteristics, control of inspections, etc. Formation of the technical team constitutes a fundamental aspect in order to initiate an orderly certification program. Special emphasis was given to having farmers present during each field inspection with the object of directly imparting technical advice.

Development of seed producers included various seminars and meetings, the first of which was attended by 9 of the 15 principal producers of soybean seed registered in ANAPO. The Adviser presented the seminar jointly with CIAT technicians and counterparts of MACA. In other meetings with seed producers during the summer, effects of rains in the post-maturation stage on the quality of seed was emphasized. This training was carried out in a theoretical and practical way using seed germinated in the laboratory. Other training courses were offered to farmers of the OKINWA Cooperative for the production of soybean seed in winter.

Due to the excessive and belated rains in Santa Cruz, only 1,200 hectares of soybeans were considered suitable for harvest of seed by April 15. However, without drying facilities, adequate handling after harvest would have been impossible. It was hoped that humidity in the field would decline which would permit saving part of the seed without artificial drying. Unfortunately, conditions became even worse and at the end of April, only 300 hectares were left, which were lost in May.

This disastrous phenomenon reveals the humidity problems in Santa Cruz and gives a very clear indication of the necessity of having adequate facilities for drying and storage. It was recommended to the soybean seed producers that they obtain their own drying facilities on the farm, since MACA's capacity next year will not be enough for all crops. This need is even more serious if it is understood that harvest is carried out in a short period, and in the case of seed, harvest must be immediate once threshing is possible (generally between 16 and 18% humidity of seed).

In view of the above mentioned problem the program of soybean seed production in winter was activated. This work was done jointly with the new Regional Seed Director in Santa Cruz, in coordination with ANAPO.



Sampling of Soybeans Plants during a field inspection. Santa Cruz, February 1981.



Explanations of the importance of weed control to soybeans seed producers. Santa Cruz, February 1981.

c. Production of Foundation Seed

In coordination with MACA, the adviser supports CIAT in the release of new varieties and the production of foundation seed, which will form the base for the certification program in future years. Theoretical and practical training was carried out with CIAT personnel in the production of basic seed for soybeans and corn. During the report period, purifications of virotic plants and varietal mixtures were made in lots produced by CIAT in the Saavedra Experimental Station.

In soybeans, CIAT has delivered foundation seed of USV-1 with which a field of 25 has. was established, from which registered seed will be obtained. In corn, CIAT produced foundation seed of yellow cuban and yellow swan for the establishment of fields of registered seed. This constitutes a very important step for the development of a production system which begins in the experimental stations, continues with the multiplication process in which MACA must actively participate, and should end in farmers' fields in the form of improved seed of high yield potential.

In rice it was recommended that MACA pursue the CICA-2 variety, which was imported from Colombia by the Agronorte company and is being multiplied by transplanting under irrigation. This material should constitute the original material to spread this variety in Eastern Bolivia. This variety, which has very desirable characteristics, would be of great benefit to the farmer because of its high productivity and resistance to *Piricularia oryzae*.

In future agricultural campaigns, support will continue to be provided in the process of releasing seed from improved varieties so that process can be strengthened. This activity is of a great importance, since the seed activity of the entire country depends on this initial and essential step.

d. Other Activities

The adviser developed "Specific Certification Norms for Soybean Seed" based on his experience in Bolivia. These norms will serve as a guide to form the certification program in the short-run, and should be modified as the technology of seed production advances in Bolivia.

Chemonics initiated a series of meetings with the National Seed Director to establish more firmly the basic guidelines and plans which should serve as a guide for the seed program, and to define consultant's responsibilities. The priorities in Santa Cruz were established, which are soybeans, corn, and rice, and it was decided that Chemonics' Adviser should also provide assistance in production of soybean seed in the Chaco. At the national level it was agreed that first priority will be given to the installation of seed plants in Tarija and Betanzos and to the completion of the plant in Warnes. First priority for additional technical assistance would be in production of wheat seed in Cochabamba, Chuquisaca and Tarija.

Chemonics' Adviser in Seeds visited Tarija with the purpose of holding a dialogue with authorities responsible for the Gran Chaco Project and to visit seed representatives in Tarija.

A plan was prepared for on-the-job training of seed technicians from other regions of Bolivia in July, August and September. Dr. Caray would be in charge of conducting the courses and providing practical training in the field, in the laboratory and in the processing plant. The program would be designed for three or four technicians from other areas and to technicians from Santa Cruz at the same time.

Seed cleaning tests were carried out in the laboratory and a list of additional screens was prepared for seed cleaning and selection utilizing the CRIPPER seed cleaner in Warnes.

c. Summary

The objectives for the report period have been achieved despite delays in the installation of machinery in the Seed Plant in Warnes, which was not done on time for summer harvest. Although Chemonics does not have primary responsibility for this work, we are aware of the administrative difficulties that INCA must overcome and the personnel limitations of the Seed and Engineering Departments. Therefore, Chemonics provided support in technical aspects and in completing the necessary formalities.

Unfortunately, the first year of work in seeds was not very encouraging, however, we consider that to initiate a complex program such as that of seeds, requires a great deal of experience. Summer 1980-81 was a period for practice and preparation in which some of the requirements for the program have been fulfilled, such as the processing plant and basic seed production. The requirement still pending is formation of a complete technical team for seed certification.

f. Suggestions

Chemonics considers that the experience of summer 1980-81 has been useful as a trial, however, INSA did not possess all basic requirements to start a complete seed program. Two crucial aspects are the processing plant and technical personnel.

At present some details are pending completion regarding plant installation and putting machinery into operation for the harvest in winter this year. We recommend carrying out acquisition of special screens for the CRIPPEL seed cleaner in Barnes. Regarding the team of technical personnel, INSA now has a laboratory specialist, Lic. Martha Soliz, a second technician who will devote his time to the field and to the processing plant, and an engineer who works as Regional Director with responsibilities of supervising all aspects of work -- processing, field, laboratory, administration, and institutional coordination. From the above, it can be seen that there is no personnel to devote time to field inspections exclusively, which is a fundamental aspect of the certification program. Therefore, we recommend increasing the number of personnel in the Seed Department in Santa Cruz by adding two additional technicians who could specialize as field inspectors in soybeans, corn, rice and possibly beans and wheat. This measure will be necessary at the beginning of planting of the 1981-82 summer crop. It is also recommended to approve financing for on-the-job training of three or four technicians currently employed by INSA in different areas of the country. Chemonics' Adviser will carry out training during winter months in Santa Cruz.

B. Heavy Equipment Maintenance

1. Background and Objectives

In December 1960, USAID approved financing for the acquisition of equipment and tools for the completion of the shop at Palmar Chico. Chemonics had begun work on this purchase in the United States the same date, and the specifications were completed prior to January 1st. The first priority was to complete the acquisition during this report period.

Chemonics' Adviser was on vacation and took leave without pay during January and most of February. His objectives for the period included the completion of installations which were lacking in the Shop, such as:

- electrical installations
- fuel tanks
- lubrication equipment
- wash rack

In addition, work during the period implied making all heavy equipment operational for the 1961 land clearing season beginning in April. For this purpose, Chemonics helped in various minor purchases of spare parts.

During the period a possibility arose for COFETAP to provide support to the Integral Cooperative in the Chaco in maintenance of agricultural machinery. Therefore, another objective of the consultant was to help establish the responsibilities of COFETAP and Chemonics regarding the needs of the Cooperative.

Finally, an evaluation of the Gran Chaco Project was pending, in which Chemonics provided assistance.

2. Progress

a. Equipment and Tools Acquisition

While requests for quotations were being requested by Chemonics' Specialist in Acquisition in Washington, MACA and Chemonics prepared a

letter of understanding and an amendment to the Chemonics Contract to clarify responsibilities of both institutions. Due to modifications suggested by USAID, this agreement was not concluded until the end of February. It was established that the port of entry would be Santa Cruz, that MACA would be responsible for customs dispatch and nationalization, and that CVETAF would provide transportation to Yacuiba. A series of meetings were held with USAID about regulations which apply to this acquisition, including:

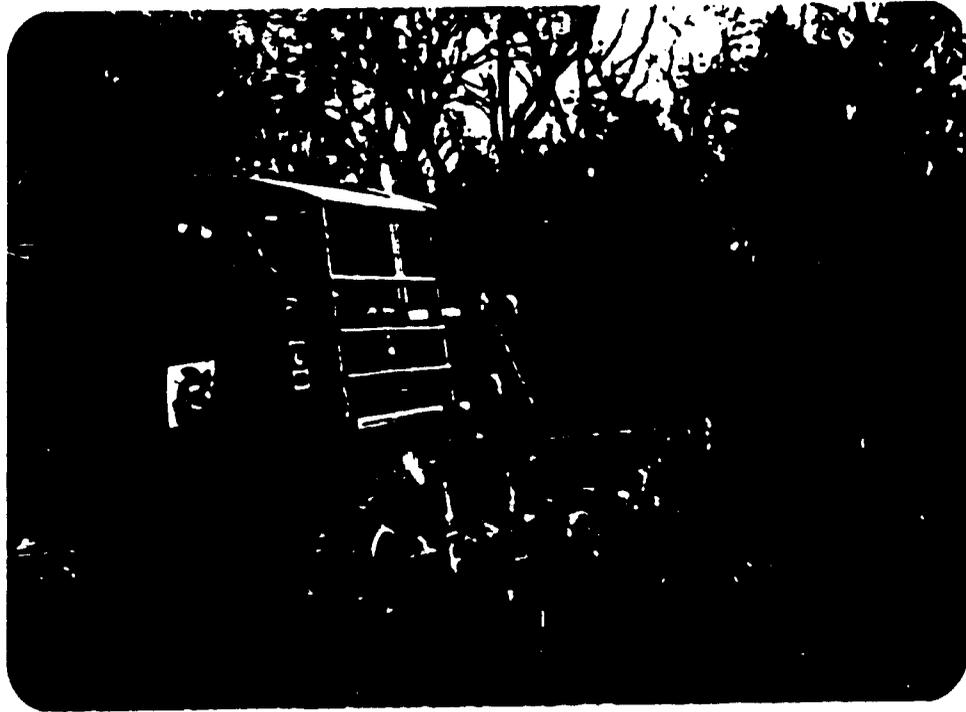
- Method of payment
- Use of air freight
- Use of non-American carrier
- Waiver of requirement to publish request for quotations

A letter of commitment was opened at the end of March in the United States on the part of AIT/Washington, and Chemonics proceeded with awarding the bids. Unfortunately some of the suppliers did not have all articles in stock, and they had to be ordered from factory. This situation caused delays in shipment of tools which were available, and required an extension of the letter of commitment until August 31st. This extension was not approved until June 26th. In that date, most of spare parts and tools from Snap-on, International Harvester, Rockwell and Lilliston were at the airport in Washington, and those from OTC and PRCTC were en route. Still, several special tools, which represented 10% of the awarded cost, were pending manufacture.

Finally, several specifications had to be clarified with suppliers through Chemonics' Adviser, Mr. Les Rios, and it was necessary to substitute some equipment because of its high price or the exaggerated weight which implied very high shipping costs.

b. Shop Installations and Preparation of Heavy Equipment

In order to avoid delays in the program, Chemonics' Adviser purchased a large stock of spare parts, including primary and secondary fuel filters and oil filters while on vacation in the United States. Chemonics helped in the purchase of spare parts in La Paz for Caterpillars, low boy



One of the D7Gs in land clearing work near Chimeo. September 1979.



Areas recently cleared. Yacuiba, March 1981.

truck-trailors and the John Deere generator at the Shop. In April, the D-7G Caterpillars were ready to begin the season of land clearing and construction of water reservoirs, however, heavy rains in the Chaco did not permit work to begin until the end of June.

Elevated tanks were installed in the Shop for diesel and gasoline which will permit the continuation of work without interruption for a month in case of fuel shortage in the area. One tank was placed on an International truck to transport diesel from Villamontes to Palmar Chico.

The wash rack was completed and the steam cleaning unit was installed. A compressor and lubrication equipment was installed on another ramp. Electrical installation was carried out in May and June, placing all wires inside plastic tubes and underground. CODETAR installed the septic tank.

c. Agreement for Maintenance of the Cooperative's Agricultural Machinery

Chemonics' Adviser to CODETAR and Robert P. Nathan's Adviser, who works with the 'Gran Chaco' Integral Cooperative, developed a plan by which both institutions would work jointly in equipment maintenance and training of personnel. At the suggestion of the Manager of the Cooperative, Chemonics presented this plan to CODETAR and USAID; the latter institution provides financing for both projects under different loans. At CODETAR's request, Chemonics prepared an operating plan and cost estimations under which CODETAR would be responsible for the maintenance of all machinery owned by the Cooperative. At the end of the semester, this plan was under discussion between the institutions involved in the Chaco. Due to lack of funds for technical assistance for the Integral Cooperative, it was suggested that an adviser in machinery maintenance and field training be added on the part of Chemonics. This suggestion was presented to the Director General of MACA for his consideration.



The truck-trailor being prepared to carry a D7G tractor to the work area. Palmar Chico, April 1981.



The tank for diesel mounted on the International truck. Palmar Chico, April 1981

d. Evaluation of the Gran Chaco Project

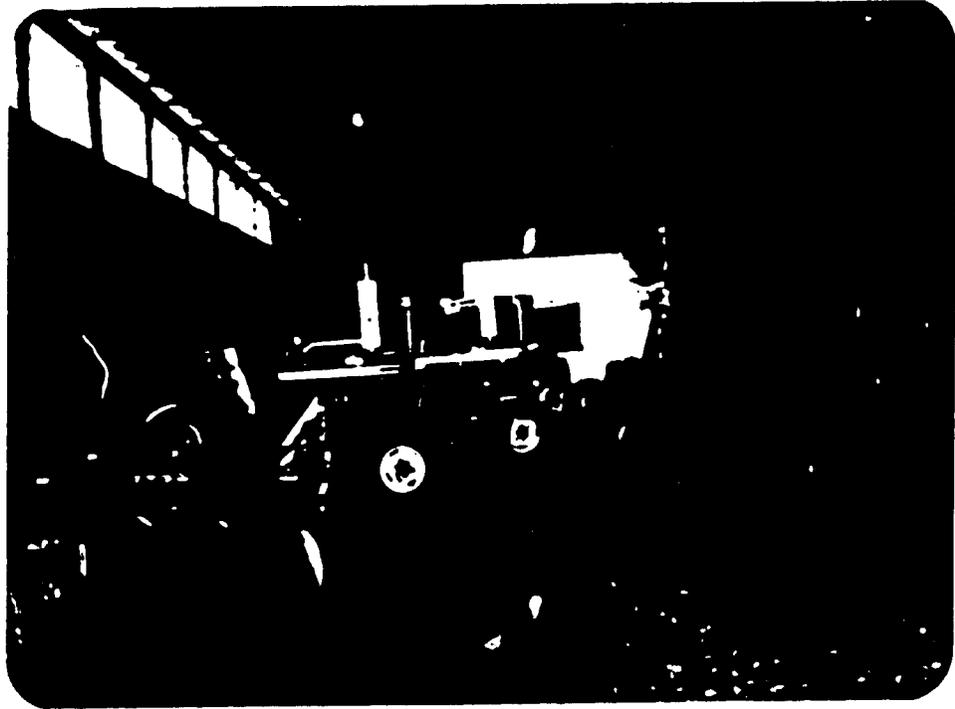
An evaluation of the Gran Chaco Project was done by USAID with the support of Mr. Jeff Dorsey, Agricultural Economist from the University of Wisconsin, and Dr. Van Hadderlie, Expert in Soils from the Soil Conservation Service from the State of Montana. At USAID's request, these experts were accompanied by Chemonics' Chief of Party in Bolivia in their trip to Chaco. During one week in February, the team visited several sites in the agricultural zone of the Chaco, conducting interviews with farmers and inspecting fields with potential erosion damage. CODETAR made available the services of a light plane to fly over the zone so that the experts could familiarize themselves more rapidly with environmental problems. Mr. Dorsey based his work on a survey of farms previously carried out by Lic. Isaac Torrico of USAID/Bolivia.

The results of the evaluation were very valuable for CODETAR, USAID, BAZ, IETA and for the Integral Cooperative. In meetings held in La Paz, Tarija and Yacuiba, recommendations made by the experts were made known, including the recommendation to provide technical assistance in soil conservation in the Chaco. Chemonics developed the corresponding terms of reference in collaboration with IETA.

e. Other Activities

The Heavy Equipment Maintenance Adviser developed a plan for in-service training in the Shop and in the field. Under this plan the Adviser would supervise the apprentices during one year in jobs such as:

- Lathe
- Electrical and gas welding
- General mechanics and major repairs
- Automotive electrical skills
- Warehousing
- Lubrication
- Preventive maintenance in the field
- Control, reports, work orders, etc.



Part of the agricultural machinery owned by the "Gran Chaco" Integral Cooperative. Campo Pajoso June 1981.



Erosion in land cultivated during two years in the Chaco. Chimeo, March 1981.

The objective of this training is to increase the number of persons with specialized knowledge in maintenance for future employment by CODETAR, the Cooperative, and other development institutions in the Chaco. Training would be more intensive if Chemonics could provide two advisers in the field of machinery maintenance.

Chemonics assisted in various aspects of planning in support of the Project, for example: discussions with VFFE about diesel supplies, machinery needs in the Chaco area, method of collection applied by BAP for repayment of equipment, methods of supplying high quality seed, and others.

e. Summary

Most objectives were achieved during this report period. Unfortunately the acquisition of tools suffered several delays, especially by the need to manufacture some specialized tools. About 90% of the equipment will arrive in Bolivia at the end of August or September this year.

Due to amount of funds involved, USAID has not responded as to the availability of funds for training in machinery maintenance. This program is of a great interest to Chemonics because the time of our advisers is better utilized when they are involved in training a technical team. The final results of Chemonics' efforts depend on advisers' transfer of knowledge to the Bolivian people.

3. Suggestions

Early this year CODETAP modified its organization so that the new office in Villamontes has equal status as the one in Yacuiha, and both report directly to Tarija. This form of organization probably functions without major difficulties for daily operations, but has very detrimental consequences for the equipment maintenance program, as well as planning and coordination of the Project. As for the maintenance system, a more functional method of organization is that the mechanics depend on only one director, who should coordinate the program from the shop. Otherwise, it becomes necessary to duplicate all maintenance equipment for Villamontes and create another maintenance system parallel to the existing one.

Within a short time the shop will be completely equipped to carry out a large number of tasks. The next step is to develop a technical team. Currently there are personnel specialized in welding, shop administration (tool room), automotive electrician, and general mechanics. CODETAR should increase personnel for the work in lathe, lubrication and warehousing in order to have the minimum of specialized personnel in basic maintenance functions. In the future, there will also be a need to specialize people in complete motor overhauls and in body and fender work, including painting.

It is recommended that the agreement with the Integral Cooperative be concluded as soon as possible to permit scheduling of technical assistance with ample lead time.

Finally, we recommend that USAID schedule funding for a one-year in-service training for eight apprentices under supervision of Chemonics. At the end of one year these people would be available for employment in CODETAR's group of technical personnel and/or that of other organizations in the Chaco with similar needs.

C. Processing and Marketing of Fruits and Vegetables

1. Background and Objectives

Terms of reference for an expert in finance and business administration to complete feasibility studies for the storage center and dehydration plant in Tarija were approved during the previous report period. This work represents the last of a series of studies carried out by Chemonics for CODETAR, CORPECH and the Juan Misael Saracho University in Tarija. The candidate to carry out this work was approved by MACA and USAID in January of this year.

2. Progress

Lic. Gustavo Vega arrived in Bolivia on January 22nd after receiving a brief orientation in Washington with respect to CODETAR's Fruit Project. He devoted 15 days in Tarija collecting and analyzing information on the market for fruits and vegetables and on operating costs of the dehydration

plant and the storage center. He carried out hypothetical tests of several methods of operation of both plants, jointly and separately, basing his analysis partly on the work of Messrs. Masson and Silva, who focused on the market and engineering aspects of fruit processing. Lic. Vega completed this information, adding more details about the form of operation of the plants, methods of acquisition of raw materials, operating costs and financial costs. He recommended the immediate installation of the dehydration plant, and recommended delaying about two years before starting the storage center. Fixed costs for the latter are very high in comparison to the low levels of production that currently exist in the area.

The results were discussed among representatives of CODETAR, the Adviser and the Chief of Party of Chemonics. Later, during the process of developing the final report on the projects, inconsistencies were found, which were amply clarified between CODETAR and Lic. Vega who offered assistance while living in Washington.

The final report was presented to CODETAR on April 27th, at which time the recommendations were again examined. Chemonics emphasized areas in which statistical information in Bolivia is weak, and indicated to CODETAR the need to begin the projects on a small scale while more experience is gained in various aspects of marketing. The recommendations were accepted and CODETAR is preparing its final feasibility study to be presented to financing institutions.

3. Suggestions

In developing the mentioned study, it was observed that CODETAR has few technical employees to attend a series of projects of different scales and to plan future projects. Therefore, Lic. Vega included financing for a specialist/manager within the operating plan of dehydration plant. In spite of the fact that this plant may operate only six months in a year, the manager should devote the remaining time to market studies and planning of the storage center. We consider that each project should have this kind of support of professional personnel to outline operating plans, study

marketing methods, develop financial plans for expansion and to incorporate private shareholders in decision making. The latter aspect becomes very important in cases where shareholders are from cooperatives consisting of rural families.

The next section presents progress in the two technical areas related to strengthening of institutions.

SECTION III
PROCESS IN INSTITUTIONAL STRENGTHENING

A. Sector Planning

1. Background and Objectives

At the beginning of the semester Chemonics was entering data for the Lineal programming model into the computer at the University of Florida. This model was previously developed in Bolivia by Dr. David Zimet in collaboration with the Sector Planning Office and the Statistics Division of MACA. Earlier, this work had suffered delays due to lack of financing for computer services; these difficulties were overcome during the previous semester. The first objective for this report period was to run the model on computer and analyze the results.

Additionally in March of this year during a meeting on the evaluation of Gran Chaco Project, Chemonics' Chief of Party offered to help CONFETAP, BAE and IBTA in the establishment of a system for tabulation and analysis of information regarding the clients of the Project. The objective for this period was to develop a theoretical framework, identify information needs and become familiar with the existing base of information in the institutions involved.

2. Progress

a. Lineal Programming Model

The theoretical framework, methodology and detailed data of the Lineal Programming Model were published and delivered to MACA in January. When the data for the model were entered into computer, it was discovered that data corresponding to land constraints by zone were missing. Chemonics requested a copy of these data from Office of Sector Planning of MACA, but did not receive an answer. Efforts to locate the data in the Statistics Office did not produce results. Therefore, we were obliged to gather the basic information a second time. Due to lack of cooperation on the part of OPS personnel and problems in the availability of Dr. Zimet's time, the model

was not completed until May. A preliminary run was made, and after making corrections, the results were ready to be sent to Bolivia in June. Dr. Zimet did a brief analysis of the results.

b. Information System for the Chaco

Regarding the information system for the Gran Chaco Project, Chemonics' Chief of Party developed the theoretical framework, which allows the identification of information needs regarding resources of the area and the clients of the Project. This document was reviewed with Eng. Aldunate of IBTA in the Chaco and efforts were made to become familiar with information available in IBTA and BAF.

c. Summary

Completion of work in Lineal Programming Model was not fulfilled in the report period due to the above mentioned reasons. Nevertheless, the important factor for Chemonics is the use that will be made of the model once completed. At present, the counterparts of MACA who worked previously on the model have resigned, and therefore, any memory about the methodology and applications of the model is lost.

Progress in the system of information for the Gran Chaco Project was achieved as foreseen. In next period, methods will be developed for the extension of the information base, tabulation of the data and analysis of results.

3. Suggestions

Development of the model began with the initiative of technicians of the Statistics Division and of OPS. However, as the work progressed, Chemonics took more and more responsibility. It is crucial that MACA assign one or two technicians to assist in analysis of the results so that the model can be utilized by MACA. We recommend that two counterparts be assigned for a period of two to three months starting September 15, 1981.

In the extension of Contract OOB/AIP 511-111 between MACA and Chemonics, modifications were included so that Chemonics' Chief of Party in Bolivia does

not have primary responsibility in planning, but that another full-time adviser be employed to take this position. We recommend that MACA carry out the restructuring of the Office of Sector Planning, which is a prerequisite in order to justify technical assistance in this important area. Meanwhile, Chemonics' Chief of Party will continue providing limited assistance to the extent time is available.

B. Organization and Methods

1. Background and Objectives

Chemonics' Technician in Organization and Methods, Mr. Robert Sparks, had been preparing a Study of Personnel of the Agricultural Public Sector since April 1980. The Study includes all personnel of MACA including its decentralized institutions, twelve in total. It covers all 4,500 employees of the Sector. At the beginning of the report period, 90% of basic data was collected and coded to enter into the computer. The first computer output for the 679 employees of SNJC was obtained. The draft report corresponding to this institution was submitted to MACA for comments.

Chemonics' objective for the period was to complete the analysis regarding the 12 institutions of MACA and to prepare the corresponding reports. However, this objective was not realistic as long as no counterpart was assigned by MACA to help with the analysis and data tabulation, a situation that existed during the previous semester. Early in the report period, MACA assigned Lic. Patricia Iturri as Director of the Office of Administrative Analysis, however, she continued with all her responsibilities in the Office of Sector Planning. The result was that Chemonics' adviser carried most of the responsibility for the Personnel Study during the current semester. To help the adviser with routine work of data coding and tabulation, Chemonics employed Lic. Guiberto Lizarraga. Apart from the fact that the adviser's time was not utilized at the maximum of his capability, there is another aspect much more important: MACA is left without personnel trained in the methodology of studies in public administration. Studies of this nature have several phases, such as:

- * Elaboration of the theoretical framework
- * Identification of sources of information
- * Information gathering
- * Design of output tables
- * Coding
- * Analysis
- * Report writing

Several persons from MACA and its decentralized institutions participated in different phases, but no Bolivian person has followed the study from the beginning to its end. When work in Organization and Methods is completed, MACA will have the reports on the Personnel Study, but it will not have improved its own capacity to carry out similar work in the measure that was possible.

2. Progress

During January and February information on all institutions was completed. Chronics Adviser travelled to Santa Cruz to obtain data on CIAT. Coding for each institution was defined according to its specific organization. As a result of the first draft on STDC, a new computer output was designed, more reduced and adjusted to needs of analysis and to the requirements for reports. Then Chronics' Chief of Party wrote a second program in FORTRAN, specific for EAB, and which produces the improved output. Analysis of this information permitted standardization of coding for all institutions, including STDC and EAB. Computer outputs include the following tables:

- * Personnel/supervisor by level of responsibility of supervisor
- * Type of position by Department and level of responsibility
- * Monthly salary by type of position and technical area of position
- * Educational level with subjects studied
- * Monthly salary by educational level
- * Years in present position by type of position and level of responsibility

- * Years of experience in the Sector by type of position and level of responsibility
- * Monthly salary by years of experience in the Sector
- * Educational level by type of position and level of responsibility
- * Technical area of position by subjects studied

Analysis of tables was carried out for preparation of reports. The Adviser held meetings lasting various days with each institution to adjust the analysis to the specific situation of each institution. During these meetings some of the results were reviewed with representatives of the institutions. Only part of the information of computer outputs is included in the reports because of the great amount of data, even summarized as described above. Output tables will be delivered together with the report to the interested institution and MACA. Another copy will remain with Chemonics as backup, and the magnetic tape is also available.

The following individual reports were prepared in draft by the end of June:

- * SNTC
- * RAE
- * IBTA
- * MACA
- * CDF

Still pending preparation are the reports for INC, Reforma Agraria, SENAPE, CIAT, IIPA, PFORES and INFOL. In addition, we intend to prepare a combined global report for all personnel of the Agricultural Sector.

In summary, the Study of Personnel progressed according with available human resources, however, the goal to complete all reports within the semester was not achieved. As was pointed out before, this objective was not realistic since no counterpart from MACA was assigned full-time to the Office of Administrative Analysis.

3. Suggestions

The purpose of the Study of Personnel, as it was originally formulated in March 1980, was to dispose of information and analysis of human resources in the Sector, with the idea of implementing an institutional restructuring. Chemonics considers that we will achieve our part in this effort during next period, and that the initial objective still remains valid. We recommend that MACA distribute the reports widely to all who are interested so as to encourage ideas and to define the basis for institutional changes.

Next section presents progress in coordination of the different technical areas and in administration of Chemonics.

SECTION IV
PROGRESS IN PROJECT COORDINATION AND ADMINIS-
TRATION

A. Background and Objectives

The activities reported in this section mainly reflect the responsibilities of Chemonics' Chief of Party in Bolivia, who receives support of his Supervisor from Chemonics/Washington, Ms. Candace Conrad. Description of activities is reduced to only a mention in many cases, since detailed information is included previously in the progress in technical areas.

The principal objectives for the semester were the following:

- * Prepare the progress report for July through December 1980
- * Review and publish the report for the feasibility study of the storage center and dehydration plant in Tarija
- * Provide support in Organization and Methods in computer programming and data analysis
- * Review the first reports of Personnel Study of MACA
- * Prepare a report on results of lineal programming model
- * Together with MACA and CODETAR, plan future needs for technical assistance in soil conservation, machinery maintenance, sector planning and credit to small farmers
- * Prepare a new budget for the extension of Chemonics' Contract until December 1981
- * Provide support in the evaluation of the Gran Chaco Project
- * Participate with MACA in the evaluation of Chemonics' efforts
- * Provide support to MACA in the installation of the seed plant in Warnes
- * Coordinate the acquisition of equipment and tools for CODETAR's shop in Palmar Chico
- * Assist CODETAR in minor purchases of spare parts and tools
- * Help to define CODETAR's role in the maintenance of machinery pertaining to the Integral Cooperative in the Chaco

- * Assist in programming and coordination of the Gran Chaco Project and the Seed Program
- * Revise Chemonics' accounting system regarding pending accounts
- * Reformulate procedures for obtaining liberations of articles imported by Chemonics

B. Progress in Coordination of Technical Areas

1. Seed Improvement

Chemonics' Chief of Party utilized 18% of his time in this technical area, mostly providing support to the Seed Department to complete procedures for installation of equipment and construction of drying bins at the Seed Plant in Warnes. Additionally, minor acquisitions of equipment and training materials for the use of the Seed Specialist were coordinated.

A series of meetings were initiated with the National Seed Director to establish more concretely plans and projects for Santa Cruz, the Chaco, and other areas of the country. The process to establish a seed program in the Chaco was initiated. Finally, the priorities for technical assistance in seeds were agreed upon with MACA.

2. Heavy Equipment Maintenance

The acquisition of equipment for the shop was coordinated among MACA, USAID, CODETAR, Chemonics/Washington and Chemonics' Adviser in Yacuiba. At the end of the semester 90% of the equipment was prepared to be shipped to Bolivia. The remainder was ordered from factory and it will take several more months.

Chemonics' Chief of Party assisted CODETAR in formulating an agreement for the maintenance of agricultural machinery of the 'Gran Chaco' Integral Cooperative. This work was coordinated with CNCICOOP, and USAID.

Support was given in the evaluation of the Gran Chaco Project in collaboration with USAID personnel. Then in subsequent meetings, assistance was provided to CODETAR and BAB in various aspects of Project administration. Activities in this technical area took 25% of the time of Chemonics'

Chief of Party.

3. Processing and Marketing of Fruits and Vegetables

Technical assistance was provided to COFEFAR in reviewing the recommendations of the short-term adviser and completing the report which provides the basis for the feasibility study of the dehydration plant and the storage center in Tarija. Recommendations were formulated regarding the management of the plant.

4. Sector Planning

After several attempts to recover misplaced data on land constraints by zone, this information was again gathered so that the model could be run on the computer at the University of Florida. The results were not received by the end of the semester.

Initial steps were taken to formulate an information system for the Gran Chaco Project.

A new definition of Chemonics' responsibilities in sector planning was established and new terms of reference were incorporated into the Contract.

5. Organization and Methods

Chemonics' Chief of Party wrote the programs to tabulate information for the Personnel Study and provided support in the analysis of the results. The first of a series of reports, which will be published on this study, was reviewed.

6. Summary

Most of the objectives in the coordination of work in technical areas were accomplished, however, three of the main tasks were not completed:

- * installation of the seed plant (90% completed)
- * equipment and tools acquisition (75% advanced)
- * report on results of the lineal programming model (the results are ready to be sent to Bolivia)

Coordination and support of technical areas of work required 62% of the time of Chemonics' Chief of Party, compared to 40% in the previous semester.

C. Progress in Contract Administration

During this period, several adjustments in administration methods have been carried out. As was foreseen in the previous progress report, methods of management and control are improving in different aspects of implementation and execution of the various phases of the project.

The following specific tasks were carried out under the supervision of the Chief of Party of Chemonics, with the cooperation of the Administrator, Mr. Corsino Baptista Icyes:

- * Inventories of furniture materials and equipment in La Paz and in Santa Cruz and Yacuiba offices.
- * Reorganization of procedures of legalization for all imports which were pending or delayed. These procedures were channelled through pertinent offices of the General Controller of the Republic (Official Dispatches), thus reducing operating costs.
- * Accounting adjustments of previous year and the setting up of auxiliary records to control current account statements and holding accounts of third persons; actualization and/or balance liquidation.
- * Renewal of rental contracts of interest to the Company and its personnel, achieving reductions in costs or improvements in services.
- * Improved control of petty cash, reducing funds in La Paz to the minimum necessary.
- * Extension of telephone service with an additional external line.
- * Insurance renewal.
- * Timely payment of debts as Retention Agents for taxes, avoiding payment of charges and fines.
- * Assistance to the Office of Coordination of MACA in its requirements of information; details and summary of activities and corresponding expenses.
- * As a consequence of MACA's decision to terminate work in O & B, the need to reduce support personnel in La Paz was established.

In summary several methods were implemented to reduce operating costs and increase the effectiveness of consultant's administration.

F. Suggestions

The principal counterpart of Chronics in coordination of technical work and Project administration is the Director General of Agriculture. As reflected in several parts of this report, this system permits MACA to make decisions from a technical point of view and without ambiguities. The fact of having only one authority who defines MACA's position simplifies the supervision of the various technical fields in which Chronics has responsibilities. At the same time, all administrative procedures are channelled through the Office of Coordination of MACA. With the object of avoiding duplicity between the duties of the Director General and those of the Office of Coordination, we recommend that the responsibilities of each be clearly defined. Forms of simplifying procedures and facilitate the work of the Office of Coordination should be sought after.

The next section presents the summary of the main recommendations of this report, then come the conclusions and objectives for the next semester.

SECTION V
SUMMARY OF RECOMMENDATIONS

For the benefit of the reader, principal recommendations are reiterated in this section. It will be observed that many of the recommendations refer to the need to increase the number of qualified personnel for the programs in which Chemonics provides assistance and/or to provide funds for training. We hope that MACA, COETAP and USAID give these recommendations their serious consideration.

We urgently recommend that MACA hire one or two additional technicians for field inspections for the seed certification program in Santa Cruz, starting in summer of 1981-82. The approval of funds for on-the-job training of three or four technicians during winter this year is recommended. The technicians would be chosen by the National Seed Director among the personnel currently working in seeds with MACA. Thirdly, we recommend approval of funds for the purchase of specific screens for cleaning and sorting of soybean and corn seed in Bolivia.

Regarding the Gran Chaco Project we recommend that COETAP finalize the agreement with the Integral Cooperative for the maintenance of agricultural machinery. Once this agreement is established, needs for technical assistance in this field must be programmed. COETAP should increase its fixed personnel in the shop to be specialized in lathe, lubrication, and control of the parts warehouse. We recommend that USAID approve funds for training of eight apprentices in equipment maintenance.

The recommendation made during the evaluation of the Gran Chaco Project, which indicates the need for technical assistance in soil conservation, should be implemented. The base institution for the adviser should be IETA.

Regarding COETAP's Fruit Project, we recommend to financing institutions that they immediately proceed with the dehydration plant, and that the storage center be considered within two years.

We recommend that MACA assign two technicians from the Direction of Sector Planning or from the Statistics Division to assist in the analysis of the results of the linear programming model and the elaboration of the report. The technicians would have to dispose of two months, full-time as a minimum.

In Organization and Methods, we recommend wide distribution of reports of the Personnel Study of the Agricultural Sector with the purpose of encouraging ideas and forming guidelines for institutional reorganization.

Finally, we recommend the clarification of the functions of the Office of Coordination and standardization of procedures with the purpose of facilitating interaction between MACA and USAID.

SECTION VI

CONCLUSIONS AND FORECASTS

The final benefit of Chronics' efforts in Bolivia will consist principally in the training of local people, however, the opportunities for training have been limited due to lack of facilities and counterparts. During the semester of this report the first of these limitations has been overcome to a great extent, and therefore, the lack of personnel on the part of WACA, and partially on the part of COCTEAR, will be a factor of increasing importance.

It is important to recognize that training not only consists of transfer of knowledge related to specific practices, but also consists in demonstrating professional skill in organization and development of the programs, themselves. To give examples, the Adviser in Heavy Equipment Maintenance, not only supervised installation of the shop, but the more important aspect of his work is that he organized a system for maintenance. To organize and establish a complex program depends on concepts regarding the various functions of the maintenance program (lathe, lubrication, parts warehouse, etc.), interphases between functions, control of each function, priorities among them, and resources that must be dedicated to each one. Similarly, the Seed Program requires technical knowledge about specific practices, such as sampling for field inspections, methodology of effecting germination tests, etc., but, the most important contribution of the Adviser has been in providing support to his counterparts in building the program, which depends on coordination with several institutions. In this case, critical functions are release of new varieties, production of foundation seed, field inspections, laboratory analysis, certification standards, production methods and seed handling by the farmer, drying and processing, and marketing methods. Establishment of the program depends on all these functions operating jointly, and that necessary resources be assigned to each one in accordance with expected results. Similarly, in the cases of Planning and Organization and Methods, the benefits that the advisers can

offer not only consist of data analysis and final reports, but also from the experience of the methodology to obtain the results. For these reasons, it is crucial that client institutions assign the necessary number of counterparts to carry out projects where foreign experts are assigned, and that the assignment be sufficiently stable to permit the same personnel to follow a project from beginning to end.

The objectives for next semester are presented below, many of which depend on the aspects mentioned above.

With reference to the Seed Program, the principal objectives from July to December 1981 are the following:

- * Carry out winter training for technicians of the Seed Department from other regions of the country and from Santa Cruz.
- * Develop a technical team, including two persons specialized in field inspections.
- * Support in follow up of winter soybean and corn seed lots, in the field, and phases of drying, processing and quality control.
- * Give support to put the processing plant in operation, and assist in obtaining optimal utilization of same. This depends on the quantity of seed produced under the certification program and on efficient operation of the plant.
- * Initiate the program of seed production for the summer of 1981-82 in soybeans, corn and rice. The first two will receive emphasis in the south of Santa Cruz.
- * Support development of the seed program in the Chaco in coordination with IPTA.
- * Provide support to MACA in promoting utilization of improved seed in coordination with CIAT, producers associations and others.

Achievement of most of the above objectives for seeds depends on coordination among interested institutions. Only in this way, MACA can achieve maximum utilization of the available equipment and recuperate its investment.

Regarding Machinery Maintenance, if COPELAP reaches an agreement to support the Integral Cooperative, Chemonics will need another adviser for the program. The objectives at present are:

- * Receive tools and equipment for the shop and deliver them to COPELAP.
- * Complete installation of the shop with the new equipment.
- * Set up systems for control in the parts warehouse with ledger and reception and dispatch notes.
- * Support farmers in the area with maintenance services.
- * Clean, check and prepare the eight P7C tractors at the end of the land clearing season, including rollers, and adjustment of final drives (this work will take 2 months or more).
- * Change chains and tracks in cases where necessary.

Another objective for the Gran Chaco Project is to bring an adviser in soils conservation, who should start work at the beginning of the agricultural activities this year. The authorization of USAID is expected in order to implement this work.

Regarding the field of planning, the objectives for next semester are:

- * Carry out the analysis of results of linear programming and prepare the report for MACA.
- * Set up methods of information collection referring the Gran Chaco Project.

In the area of Organization and Methods, the objectives are related to results of the Personnel Study. We plan to publish the reports in the following order:

- * First, SNMC, RAB and INTA
- * Second, Central MACA
- * Third, report on all personnel of the Sector
- * Fourth, reports on Reforma Agraria (Land Reform) and the National Institute of Colonization (combined in one) and CDF
- * Finally the reports for IIRA, CIAT, PRODES, INFOL and SENAFB

The Adviser in Organization and Methods will remain only until mid-July to advance this work to the extent possible.